Machinists

Table of Contents *(scroll or use links below to navigate document)*

View Career Video

What They Do

Almost everything we touch in our daily lives, such as the automobile you drive, contains parts crafted by a Machinist. Even items as books, magazines, and ice cream sundaes depend upon the skills of a Machinist in their production. Ice cream sundaes? Ice cream sundaes begin with a milking machine to milk the cow, a separating machine to separate the cream from the milk, an ice cream making machine to create the ice cream, a freezer to store it, an ice cream scoop to serve it, and a spoon to eat it. A Machinist is the key person in producing the needed equipment and utensils that ultimately result in the ice cream sundae you enjoy. The cow helps a little too!

Machinists use machine tools, such as lathes, drill presses, and milling machines to produce precision metal parts. Some Machinists produce large quantities of a single part. Other precision Machinists produce small batches or one-of-a-kind items. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations needed to make machined products that meet precise specifications.

Tasks

- Study sample parts, blueprints, drawings, and engineering information in order to determine methods and sequences of operations needed to fabricate products, and determine product dimensions and tolerances.
- Calculate dimensions and tolerances using knowledge of mathematics and instruments such as micrometers and vernier calipers.
- Select appropriate tools, machines, and materials to be used in preparation of machinery work.
- Set up, adjust, and operate all of the basic machine tools and many specialized or advanced variation tools in order to perform precision machining operations.
- Machine parts to specifications using machine tools such as lathes, milling machines, shapers, or grinders.
- Align and secure holding fixtures, cutting tools, attachments, accessories, and materials onto machines.
- Monitor the feed and speed of machines during the machining process.
- Measure, examine, and test completed units in order to detect defects and ensure conformance to specifications, using precision instruments such as micrometers.

*Detailed descriptions of this occupation may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.*

EDD Employment Development Department State of California
LMID Labor Market Information Division "Your Information Source"

Machinists

Important Skills, Knowledge, and Abilities

- Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
- Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.
- Operation and Control — Controlling operations of equipment or systems.
- Equipment Selection — Determining the kind of tools and equipment needed to do a job.
- Troubleshooting — Determining causes of operating errors and deciding what to do about it.
- Reading Comprehension — Understanding written sentences and paragraphs in work-related documents.
- Quality Control Analysis — Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
- Equipment Maintenance — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
- Problem Sensitivity — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
- Arm-Hand Steadiness — The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.
- Information Ordering — The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
- Near Vision — The ability to see details at close range (within a few feet of the observer).

Work Environment

Machinists work indoors in machine shops or factories which may or may not be air conditioned or heated. Machinists spend most of the day on their feet and must follow safety rules. They wear safety glasses to protect their eyes from flying metal pieces. Loud noise from machinery requires use of hearing protectors. Machinists often supply their own tools.

Machinists who work for large employers may belong to unions such as International Association of Machinists and Aerospece Workers. Generally, Machinists working for small employers do not belong to unions.

Some manufacturing plants operate around the clock, and Machinists may be required to work evenings, nights, or weekends as well as overtime when needed. As workers obtain seniority, they have more choice about shift assignments.

Machinists

California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
Machinists				
51-4041	34,200	37,300	1,110	$13.84 to $22.71

Wages do not reflect self-employment.
***Average annual openings** include new jobs plus net replacements.*
Source: www.labormarketinfo.edd.ca.gov, Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

Trends

The occupation of Machinist will grow slower than average for all California occupations. Most job openings will come from Machinists retiring. Additional growth for Machinists jobs will occur in temporary help firms. Union membership is in decline because of outsourcing to nonunion shops.

Training/Requirements/Apprenticeships

Machinists can obtain training in several ways:

- Formal, four-year apprenticeship
- Vocational school
- Community college programs or certificates
- Extensive on-the-job training

Four-year apprenticeship programs combine classroom and on-the-job training. Information about Machinist apprenticeships may be found at www.dir.ca.gov, a Web site that hosts an apprenticeship database maintained by the Division of Apprenticeship Standards. Apprenticeships require a high school diploma or GED.

Classroom training is often offered through community colleges and vocational schools. Degree and certificate programs in Machine Shop Technology, Machine Tool Technology, and Precision Systems Maintenance and Repair Technologies are offered in the community colleges.

Recommended High School Course Work

Helpful courses for high school students interested in Machinist work include mathematics, especially trigonometry, metalworking, machine shop, and drafting.

Where Do I Find the Job?

Machine shops are the largest employer of Machinists, although most job growth will be in the temporary help (contract work) industry. Direct application to employers remains one of the most effective job search methods.

Machinists

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search using keywords from the following manufacturing industry names to get a list of private firms and their addresses:

- Aircraft Engine and Engine Parts
- Aircraft
- Bolts, Nuts, Screws, Rivets, and Washers
- Employment Placement Agencies
- Guided Missiles and Space Vehicles
- Machine Shops
- Other Aircraft Parts and Equipment
- Other Guided Missile/Space Vehicle Parts
- Precision Turned Product
- Professional Employer Organizations
- Space Vehicle Propulsion Units and Parts
- Temporary Help Services

Search these **yellow page** headings for listings of private firms:

- Automobile Machine Shop Services
- Employment - Temporary
- Machine Shops
- Metal Fabricators
- Sheet Metal Work
- Tool Designers

Where Can the Job Lead?

Experienced Machinists may advance to tool and die maker or numercial tool and process control programmer. They may be promoted to administrative or supervisory positions if the firm is large enough. They may open their own machine shop. With further education they could become tooling engineers or mechanical engineering technicians.

Other Sources of Information

International Association of Machinists and Aerospace Workers
www.iamaw.org

United Automobile Workers
www.uaw.org

National Tooling & Machining Association
www.ntma.org

Los Angeles Chapter of the National Tooling & Machining Association
www.lantma.org